rapidly retreating shorelines in the United States. The major effect of this sediment is to attenuate incoming wave energy, thus providing conditions favorable for further sedimentation. The initiation of a new cycle of sediment input will provide us with our first opportunity to study the processes that have led to development of the Louisiana chenier plain over the past 5,000 years.

Computations based on current and sediment concentration measurements reveal that the volume of sediment carried west from the Atchafalaya River is on the order of 50×10^6 m^3/year, a value that represents nearly one-half of the sediment that leaves Atchafalaya Bay. Process-oriented field studies initiated in 1980, together with satellite imagery, color infrared photography, and aerial overflights since 1974, indicate that mud-flat sedimentation is increasing to the west. A reversal of the overall pattern of coastal retreat now characteristic of the chenier plain is expected when Atchafalaya Bay becomes sediment filled, thus allowing an even greater volume of sediments to enter the dynamic shelf region seaward of the bay.

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Depositional Environments and Regional Stratigraphy of Jurassic Norphlet Formation in South Alabama

In the western Gulf coastal plain area the Norphlet Formation is typically characterized by nonmarine and red bed lithofacies. In south Alabama, the Norphlet consists of an updip conglomerate, a basal shale, red beds overlying the shale, and an upper quartzose sandstone, the Denkman Member. The Norphlet unconformably overlies either salt, anhydrite, red beds, or Paleozoic rocks. The Smackover Formation overlies the Norphlet with a sharp contact over most of south Alabama, except in parts of Mobile County where the contact is gradational.

The conglomeratic lithofacies is discontinuous in areal extent, and is present in cores from Escambia, Monroe, and Wilcox Counties. It consists of red and gray sandstone, conglomerate, and conglomeratic sandstone. The shale lithofacies also appears to be discontinuous in areal extent, and is present in cores from Escambia County. It consists of mostly black shale, with some brown and red shale. The red bed lithofacies was penetrated in wells in Escambia and Clarke Counties. It consists of red, brown, and gray, very fine to coarse-grained sublitharenite and subarkose, with an average composition of 64% quartz, 13% feldspar, 8% rock fragments, and 10% matrix. It is characterized by low-angle planar cross-beds and discontinuous laminae, along with interbedded silt and coarse sand. The quartzose lithofacies (or Denkman Member) is present in cores from Mobile, Baldwin, Escambia, Clarke, Choctaw, and Washington Counties. It attains a thickness of from 400 to over 700 ft (122 to over 213 m) in parts of Choctaw, Washington, and Mobile Counties, and thins to the northeast and east (Clarke, Monroe, Conecuh, and Escambia Counties) where Norphlet red beds and conglomerates predominate. The quartzose lithofacies consists of gray and brown, very fine to medium-grained subarkose with an average composition of 76% quartz, 12% feldspar, 3% rock fragments, and 2% matrix. It is characterized mainly by low to high-angle planar cross-beds, and also contains slump structures, wavy discontinuous laminae, and massive intervals.

Norphlet deposition in south Alabama occurred in an arid climate. The lower shale probably was deposited in lagoons or mud flats left from a retreating hypersaline sea which had deposited the Louann salt. Accompanying the retreat of this sea were climatic and/or tectonic changes which resulted in clastics being shed from exposed paleo-highs. Initial clastic deposition occurred in alluvial-braided stream environments which are represented by sediments of the conglomeratic and red bed lithofacies. These sediments were reworked into downdip areas and deposited in desert dune and inter-dune environments. A transgression near the end of Norphlet time resulted in reworking of underlying sediments and deposition in intertidal environments. These deposits may be partial landward equivalents of seaward Smackover carbonates. Dune, interdune, and intertidal environments are represented by the quartzose lithofacies or Denkman Member. Basement paleohighs not only were a source of sediments but also controlled Norphlet deposition in that the formation thins or is absent over them.

The Norphlet Formation is an important reservoir in south Alabama. Stratigraphic relations indicate that lower Smackover Formation carbonate mudstone provide the petroleum source rocks. Reservoirs are facies selective, occurring mainly in Norphlet intertidal, eolian, and braided-stream deposits. Traps are due to a combination of favorable stratigraphic, structural, and diagenetic development.

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Seismic Stratigraphy and Depositional History of Holocene Sediments on the Central Texas Gulf Coast

Application of seismic stratigraphic analysis to high-resolution sparker profiles from Corpus Christi Bay, on the central Texas Gulf Coast, allows the development of a three-dimensional model of Holocene sedimentation in the study area. To establish a time-stratigraphic framework for the seismic sequence, a regional basal unconformity was picked as the lower sequence boundary and the sediment/water interface was defined as the uppermost boundary.

The seismic sequence is subdivided into discrete seismic facies based on reflector configuration, geometry, and bounding relations. Facies delineation allows the development of a model seismic facies tract composed of a lowermost complex/chaotic-fill facies, bounded by the subjacent regional unconformity, grading upward into an onlap fill facies, which then grades into an overlying parallel/subparallel/divergent facies.

Based on lithologic and textural data from borehole logs, a correlative sedimentary facies tract is found to consist of a fluvial/channel-fill facies, unconformably overlying a subjacent erosional surface and grading upward into a deltaic facies, which then grades into the uppermost bay-estuarine facies.

Chronostratigraphically, the lower, bounding unconformity is correlative with the last Pleistocene (late Wisconsin) lowstand of sea level. At approximately 10,000 years B.P., rising sea level associated with the Holocene transgression began to flood the erosional valleys, causing a gradual flux from fluvial to deltaic deposition. With continued sea level rise, the deltaic environment shifted landward (moving up the drowned valley) and bay-estuarine conditions began to dominate as sea level approached stillstand, about 4,500 years B.P. Aggradational bay fill has been the dominant mode of sedimentation since that time.

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Fluid-Inclusion Temperature Study of Paleozoic Carbonates, Llano Uplift, Texas

Homogenization temperatures of two-phase fluid inclusions in cements, recrystallized allochems, overgrowths, and vein and cavity fillings show that Paleozoic carbonates of the Llano uplift have experienced at least three phases of temperature-related, pervasive crystallization-recrystallization. These phases have modes at 70 to 80°C, 110 to 120°C, and 200 to 210°C, with ranges of 60°C, 90°C, and 60°C, respectively. These phases may represent distinct heating-cooling events, or they may be the results of a single, thermally complex event.

The lack of any discernible regional trends in the data and the fact that Cretaceous rocks locally have been heated to at least 110°C suggest that heating was not related to regional metamorphism during the Ouachita orogeny. Yet, these temperatures seem too high to result merely from heating due to depth of burial associated with any reasonable geothermal gradient.

We postulate that northeast-trending faults, which cut basement and overlying Paleozoic rocks in the region, provided avenues for pervasive heating by contemporaneous fluids from the lower crust. These faults, like those of the Balcones-Luling and Talco-Mexia zones to the east, may be genetically related to late Paleozoic-early Mesozoic opening of the Gulf of Mexico. Waning geothermal activity associated with this rifting would explain the localized heating of Cretaceous rocks.

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Paleoecology of Midway and Wilcox Groups of Alabama

Paleocene benthic foraminifera of the Midway and Wilcox Groups of Alabama have been investigated within the framework of planktonic foraminiferal biostratigraphic zonation.

The benthic foraminifera communities of these clastic sediments are characterized by low divesity and high dominance. Relation between faunal diversity and dominance places these formations in a less than ten-fathom (60 ft or 18 m) marine environment. The characteristic species of the Paleocene shallow-water environments are present in high abundances. Fluctuations in composition, large populations, and high morphologic variability are also observed.

High frequencies of the genera *Bulimina* and *Epistominella* have suggested in the past deeper marine environments, because of the recent distribution of these genera in greater depths. These two genera occur in large numbers in association with an Alabama Paleocene shallow-water community structure. Therefore, it is reasonable to think of a shallow-water environment for these two Paleocene genera. It is also possible that these genera may have lived in both deep and shallow waters and then disappeared in the shallow-water environment.

Alabama Paleocene deposits, which belong to the eastern part of the north Gulf Coast sedimentary province, are believed to have been deposited in deltaic marine and inner neritic environments. Benthic foraminiferal communities have proven to be most useful for this paleoecologic interpretation.

Poster Session Presentations

Abstracts of the Poster Session Presentations will be published in the 1981 *Transactions, Gulf Coast Association of Geological Societies.*

CASEY, RICHARD, Rice Univ., Houston, TX, et al

Preliminary Results from a Year's Study of Impact on and Recovery of Microplankton and Microbenthon Following the Burmah Agate Oil Spill

FREDERIKSEN, N. O., U.S. Geol. Survey, Reston, VA

Biostratigraphy and Paleoecology of Lower Paleozoic, Upper Cretaceous, and Lower Tertiary Rocks in U.S. Geological Survey New Madrid Test Holes 1 and 1-X, Southeastern Missouri

JACKSON, MARY L. W., Bur. Econ. Geology, Univ. Texas at Austin, Austin, TX, and L. E. GARNER, Resource Assessments, Inc., Austin, TX

Environmental Mapping in Jackson-Yegua Lignite Belt, Southeast Texas

KREITLER, CHARLES W., and SHIRLEY P. DUTTON, Bur. Econ. Geology, Univ. Texas at Austin, Austin, TX

Meteoric Water Versus Formation Water Origin of Salt Dome Cap Rock

MANCINI, ERNEST A., Univ. Alabama, University, AL

Lithostratigraphy and Biostratigraphy of Paleocene Subsurface Strata in Southwest Alabama

MCCARLEY, ANN BOGGS, Univ. Texas at Austin, Austin, TX

South-Central Colorado Rejected as Provenance for Lower Eocene Sandstones, Texas Coastal Plain

MILLER, R. J., U.S. Geol. Survey, Corpus Christi, TX, et al

Sedimentologic Effects of Hurricane Allen on South Texas Coast—Model of Storm Influence on Barrier-Island Coast Evolution

OTVOS, ERVIN G., Gulf Coast Research Laboratory, Ocean Springs, MS

Multiple Late Cenozoic Shore Indicators or Tectonic Lineaments, Northeast Gulf of Mexico

PRICE, W. ARMSTRONG, Consulting Geologist, Corpus Christi, TX

Hurricane and Standing Wave, Lagoonal Pattern Makers, Texas Coast

REZAK, R., D. W. MCGRAIL, and T. J. BRIGHT, Texas A&M Univ., College Station, TX

Geology, Hydrology, and Biology of Flower Garden Banks, Northwest Gulf of Mexico

SHIDELER, GERALD L., U.S. Geol. Survey, Corpus Christi, TX, et al

Late Quaternary Stratigraphy of a South Texas Barrier Island Complex

VAN MORKHOVEN, F. P. C. M., Shell Oil Co., Houston, TX

Cosmopolitan Tertiary Bathyal Benthic Foraminifera

WOODRUFF, C. M., JR., CHRISTOPHER D. HENRY, and CHRISTINE GEVER, Bur. Econ. Geology, Univ. Texas at Austin, Austin, TX

Regional Hydrodynamics within Edwards Limestone, South-Central Texas